

of the heat transfer required to bring about this ice formation must be exceedingly small, and the explanation given accounts for all of the facts observed.

HALOS AND RAIN OR SNOW.

By MARTIN L. DOBLER. Dated Lake Montebello, Baltimore, Md., December 27, 1906.

In compliance with the request in the MONTHLY WEATHER REVIEW of September, 1906, that voluntary observers should look up their old reports and tabulate the dates of halos and the condition of the weather for the twenty-four hours following, I am pleased to give you the best results that I can for the period of my record up to December 27, 1906. I will give both the halos that were followed by rain in twenty-four or thirty-six hours, and also those that were followed by clear weather.

TABLE 1.—Halos and rain at Lake Montebello, Md.

Date.	Halos.	State of weather following halo.
November 5, 1905.....	Solar.....	Rain, 0.06 inch, occurred on next day.
November 6, 1905.....	Lunar.....	Rainfall, 0.06 inch, occurred; partly cloudy.
February 4, 1906.....	Lunar.....	Trace of snow day following; cloudy.
February 12, 1906.....	Solar.....	Rain, 0.02 inch, followed on 3d day.
March 2, 1906.....	Lunar.....	Heavy rain, 0.53 inch, day following.
March 8, 1906.....	Lunar.....	Rain, 0.07 inch, occurred on this date.
March 24, 1906.....	Solar.....	Rain and snow, 0.03 inch, day following.
April 8, 1906.....	Solar.....	Tremendous rain, 1.96 inches, day after.
April 20, 1906.....	Solar.....	Trace of rain day after, and 0.13 inch on 3d day.
April 26, 1906.....	Solar.....	A partly cloudy day, with high temperature.
May 2, 1906.....	Lunar.....	A partly cloudy day; lightning at night.
June 10, 1906.....	Solar.....	Heavy rain, 0.71 inch, day following.
August 4, 1906.....	Solar.....	Rain, 0.01 inch, occurred 3d day after halo.
September 27, 1906.....	Lunar.....	Rain on same date; trace day following.
September 29, 1906.....	Solar.....	Rainfall, 0.03 inch, day following.
November 3, 1906.....	Lunar.....	Followed by no rain whatever.
November 23, 1906.....	Lunar.....	Followed by no rain.

NOTES FROM THE WEATHER BUREAU LIBRARY.

By C. FITZHUGH TALMAN, Assistant Librarian.

The committee appointed by the Governor of Hongkong to inquire whether earlier warning of the typhoon of September 18, 1906, could have been given to shipping has made a report entirely favorable to the officials of Hongkong Observatory. The storm is said to have been of very limited area—about one-eighth the diameter of the average typhoon—and to have moved so rapidly from a point of origin probably near Hongkong that early warning was impracticable. Doctor Doberck, director of the observatory, testified that it was "more like a tornado than a typhoon" and that it "bridges the gap heretofore existing between typhoons and tornadoes." The earlier warnings issued by Zikawei Observatory are said to have referred to a different depression, which passed northwest over Formosa. However, in a pamphlet recently issued from the Manila Observatory,¹ Father Algué maintains that the Formosa and Hongkong storms were identical, and publishes a chart showing the successive positions of the depression for a period of ten days.

It is reported in Symons's Meteorological Magazine for May that Doctor Doberck is about to retire from the directorship of Hongkong Observatory, which he has occupied since 1883.

At a meeting of the Royal Meteorological Society on April 17 a paper was read by Mr. R. L. Holmes on "The phenomenal rainfall in Suva, Fiji, August 8, 1906". About 41 inches of rain is said to have fallen in thirteen hours. This amount is partly estimated, owing to the fact that the gage overflowed several times. (The most remarkable case of excessive rainfall of several hours' duration mentioned in the 2d edition of Hann's Lehrbuch is a fall of 41.44 inches, in one day, at Cherapunji, India.)

Mr. C. F. von Herrmann, until recently in charge of the

¹ Algué, José. The Hongkong typhoon, September 18, 1906. Advance sheets of the monthly bulletin of the weather bureau for September, 1906. Manila: Bureau of printing. 1906.

Weather Bureau station at Baltimore and of the Maryland and Delaware Section of the Climatological Service, has contributed two memoirs on the local climatology of Maryland, viz, "The climate of Calvert County" and "The climate of St. Mary's County", to special publications of the Maryland Geological Survey devoted to the physical features of the counties in question. These climatological papers have also been issued separately (Baltimore: Johns Hopkins press. March, 1907). They continue the series begun by Dr. O. L. Fassig with "The climate of Allegany County" (Baltimore, 1900), to which the same writer added "The climate of Cecil County" (Baltimore, 1902) and "The climate of Garrett County" (Baltimore, 1902). In 1904 the Maryland Weather Service began publishing Doctor Fassig's "Report on the climate and weather of Baltimore and vicinity", two installments of which have been issued to date. This work, when completed, will probably be the most exhaustive treatise ever published in this country upon the climate of a single station and its neighborhood. The climate of the State, as a whole, was discussed by F. J. Walz in "Outline of present knowledge of the meteorology and climatology of Maryland", published in Maryland Weather Service, [special publication] Vol. I, p. 417-551, (Baltimore, 1899). This work includes abundant statistics concerning normal and extreme values of the meteorological elements, together with isothermal and isohyetal charts; but for collected data, i. e., data for the individual years of record, one must consult the series of county reports now in course of publication, and the special report on the climate and weather of Baltimore.

The Weather Bureau Library has recently received annual résumés of meteorological observations made at the Observatorio Cagigal, Caracas, Venezuela, under the direction of Dr. Luis Ugueto, during the years 1903-1906; also a summary of the rainfall at the same observatory during the years 1891-1902. These are the first meteorological data that have come to us from Venezuela for many years. The principal climatic statistics heretofore available for Caracas are summarized in Zeitschrift der Österreichischen Gesellschaft für Meteorologie, Bd. 7 (1872), p. 379-380. Comparing the results obtained at the Observatorio Cagigal with the earlier observations, we find certain systematic disagreements, especially in the mean temperature data, which are generally 2° to 3° C. lower in the former. It remains to be seen whether the older or the newer observations are at fault, or whether their discordance is to be accounted for by a decided difference in altitude. According to Doctor Ugueto's observations, the mean annual rainfall for the twelve years 1891-1902 was 807.9 mm. (31.81 inches).

Mr. W. F. Tyler, of the Chinese Imperial Maritime Customs, is still pursuing his investigation of the relation of meteorological conditions, especially temperature and humidity, to the sensation of discomfort. His first publication on this subject, "A scheme for the comparison of climates", was reviewed in the MONTHLY WEATHER REVIEW of May, 1904, p. 217. Now we have received a more extensive paper on the subject,² in which the psychological aspects of the question are more fully dealt with. The author's "hyther" scale ranges from 0 to 10, 0 representing a perfectly comfortable summer day at Shanghai—warm, but bright, brisk, and bracing—while 10 represents the very worst day ever experienced by the inhabitants of that city—hot, damp, and enervating. So far, discomfort due to cold has not been investigated.

A letter from Professor Scherer, director of the meteorological

² Tyler, W. F. The psycho-physical aspects of climate, with a theory concerning intensities of sensation. London: John Bale, Sons & Daniels-son. (Reprinted from the Journal of Tropical Medicine and Hygiene, April 15, 1907.)

logical observatory of the Collège St. Martial, Port au Prince, announces that the observatory is shortly to be enlarged; also that additional climatological stations are to be established in Haiti during the current year.

ELECTRIC STORM IN SOUTHERN CALIFORNIA.

The following account of an interesting electrical phenomenon at Calexico, San Diego County, Cal., on the evening of May 27, 1907, is communicated by Professor Bigelow from a letter addressed to him by C. E. Grunsky, the well-known civil engineer in charge of the reclamation of the Salton Sea. Mr. Grunsky has paid special attention to the rainfall of California and the snow on its mountain tops, and is probably correct in saying that the following is a comparatively rare phenomenon. Calexico, as its name implies, is on the boundary between California and Mexico, in longitude 115° 30' west.—EDITOR.

In this country, where it never rains, I was fortunate enough yesterday evening to witness a fine and certainly very unique electrical display. Between 5 and 6 p. m. a pronounced storm of small extent, topped by a fine cumulus cloud, was seen in the northeast, but in this valley another, with greater spread of clouds, was seen in the west, but it did not look as tho it would bring rain. Somewhat of a sandstorm preceded the storm from the northeast, which seemed to be scattered by the time it reached the international boundary. Toward 8 p. m. the storm from the west broke loose, with quite fierce lightning for a time and rain, with a continuation of lightning. With the engineers of the California Development Company, I was out watching it. Mr. Herrmann and Mr. Clarke, of the engineering force, were the first to observe an unusual phenomenon entirely new to all of us. There were four or five electrical discharges from clouds to earth, some striking within 1000 to 2000 feet, which left their courses distinctly marked by beautiful strings of fire beads. These seemed to be a bead of fire at every angle in the course of the spark, and these beads remained visible long enough to be clearly seen, perhaps one-quarter second or longer. I personally saw the phenomenon three times, twice very clearly, once thru the foliage of trees. Mr. H. T. Cory, the chief engineer and manager of the company, was the last to see it—only one flash.

I should add that there were many discharges from clouds to earth that were not of the beaded variety.

VALUE OF WEATHER FORECASTS TO NATURAL GAS COMPANIES.

Mr. W. H. Hammon, formerly professor in the Weather Bureau, under date of June 7, 1907, writes from Pittsburg, Pa., to the Editor, in part as follows:

In several of the large natural gas companies with which I am familiar the Weather Bureau records are extremely valuable. The information of weather changes, especially when colder weather is expected in winter, must be known to natural gas operators many hours ahead, in order that the additional supply of gas needed for the colder conditions may be transported the long distances now existing between the gas fields and points of consumption. Gas is now being transported into Pittsburg from points fully 150 miles distant. Some of the cities bordering on Lake Erie are bringing their supply from points more than 200 miles distant. Gas is being transported in Kansas and Missouri thru distances of 200 miles, and you can readily appreciate that under such conditions it is very desirable to know temperature changes as far into the future as possible.

METEOROLOGY IN AUSTRALIA.

From the Daily Telegraph, Sydney, N. S. W., March 14 and April 3, 1907, we learn that the scheme of Mr. H. A. Hunt, the Commonwealth Meteorologist, for the organization of the Commonwealth Meteorological Bureau, is being dealt with by the Minister for Home Affairs, section by section.

Mr. Hunt recently visited all the meteorological offices in the various states of the commonwealth and then submitted his report, with recommendations. The following points seem to be agreed on:

A central office will be organized at the seat of government, but the existing offices of the individual states will continue until the commonwealth can relieve the states of this expense. The duties of the central meteorologist will be the supervision of stations; general climatology; weather predictions and storm warnings; monthly summaries of current weather con-

ditions; care of standard apparatus and comparison, with the instruments in use at the observing stations; maritime meteorology. The central bureau will issue forecasts for the oceans of the entire Australasian area, and also for the five meteorological divisions of Australia itself; but these latter forecasts will be sent only as advisory to the divisional centers located at Perth, Adelaide, Brisbane, Sydney, and Melbourne or Hobart. Daily weather charts will be compiled at the central office by the following process: A blank map of Australia will be cut up into sections and sent to the divisional centers, each of which will enter thereon the daily telegraphic reports for its own region. Copies of these maps will be sent to the central bureaus and to the other divisional centers, where the whole will be pieced together into a complete map of the commonwealth.

Each divisional officer will receive and transmit to the central bureau all weather information. He will be responsible for the dissemination of the bureau's forecasts thruout his divisional area, and in the event of telegraphic communication with the central bureau being interrupted he will issue forecasts for his division. An isobaric chart of the whole commonwealth will be issued daily from each divisional office.

It is recognized that the work of a meteorological service must be supplied to the public and the press with every promptitude. The daily routine and information will be executed and dispatched within the twenty-four hours to which they relate.

With regard to high mountain stations, kite work and balloon work, it is proposed to defer this important research work for the present and to restrict current expenditures to the more perfect equipment of low-level observatories.

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

H. H. KIMBALL, Librarian.

The following titles have been selected from among the books recently received, as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Most of them can be loaned for a limited time to officials and employees who make application for them.

Aachen. Meteorologisches Observatorium.

Deutsches meteorologisches Jahrbuch. 1905. Karlsruhe. 1907. 66 p. 1^o.

Algué, José.

The Hongkong typhoon, September 18, 1906. Manila. 1906. 12 p. 4^o.

American climatological association.

Transactions. 1906. Philadelphia. 1906. xx, 303, lx p. 8^o.

Angenheister, G.

Bestimmung der Fortpflanzungsschwindigkeit und Absorption von Erdbebenwellen, die durch den Gegenpunkt des Herdes gegangen sind. n. p. n. d. 10 p. 8^o. (Nachrichten. Göttingen. Math.-phys. Klasse. 1906.)

Seismische Registrierungen in Göttingen im Jahre 1905. n. p. n. d. 60 p. 8^o. (Nachrichten Göttingen. Math.-phys. Klasse. 1906.)

Angot, Alfred.

Etude sur la régime pluviométrique de la Méditerranée. Paris. 1907. 19 p. 8^o.

Appell, Paul.

... Les mouvements de roulement en dynamique. Paris. 1889. 27 p. 12^o. (Scientia No. 4.)

Beutler, Friedrich.

Die Temperaturverhältnisse des aussertropischen Südafrika. Inaug.-Diss... Jena. Jena. 1906. 74 p. 8^o.

Bracke, Albert.

Les cercles lumineux. Mons. [1907?] 16 p. 16^o. (Série des curiosités de l'atmosphère. No. 5.)

Buitenzorg. Institut botanique de l'état.

Observations météorologiques. 1905. n. t. p. n. p. 1^o.

British association for the advancement of science.

Report of the seventy-sixth meeting, York, 1906. London. 1907. v. p. 8^o.

Chantriot, Émile.

La Champagne; étude de géographie régionale. Nancy. 1905. xxiv, 316 p. 8^o. Thèse... Univ. Paris. [Climate, p. 183-204. Includes an isohyetal chart. Bibliography, p. xxii.]